

INSTRUCTIONS

... FOR ...

INSTALLING AND OPERATING

ATLAS

Gasoline and Distillate Engines

ISSUED BY THE

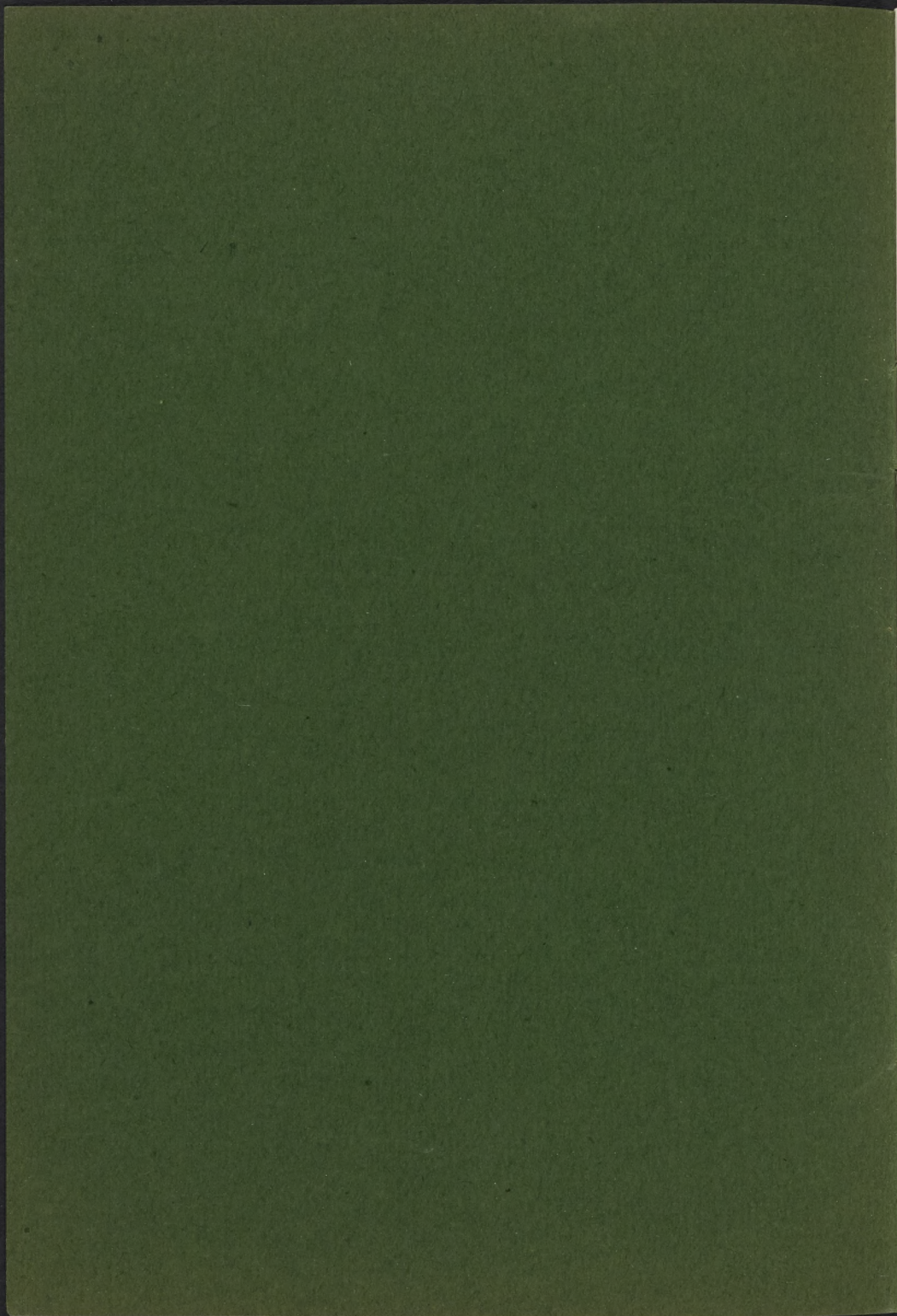
ATLAS GAS ENGINE CO.

FOOT OF 22nd AVENUE

OAKLAND

CALIFORNIA

SEPT. 1913



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STARTING ATLAS ENGINES

RETARD the spark by moving handle **1** as far back as permitted by stop, thereby causing the time of ignition to be retarded past center, pull handle **181** to position on sector marked "**Relief,**" which allows part of the compression to escape by the lifting of the exhaust valve.

Prime the engine before starting by opening the priming cocks, and inject a sufficient quantity of gasoline from a squirt can to make a charge. The amount required will depend upon the size of cylinders and quality of gasoline.

Open the fuel valve to carburetor, allowing the fuel to assume its proper level. (For adjusting, see instructions under heading of carburetor, page 15).

Throw switch on to the battery connection and turn flywheel in the direction the engine is to run. Large size engines have holes in the flywheel for starting bar for this purpose.

When engine is started shift handle **181** to the other end of sector, which permits full compression in the cylinders, and gradually advance handle **1** forward until it reaches the proper point of ignition. This point is determined by the condition of load and speed at which engine is running.

If the engine is hammering, the spark is advanced too far and must be retarded until the hammering in cylinders is stopped. (In some instances such hammering is caused by the lack of fuel).

When the engine is running at a fair rate of speed throw the switch from battery on to magneto.

SPEED CONTROL

THE speed of the engine is controlled by the governor acting upon lever **52**, thereby shutting off governor valve in valve casing **50**. The speed of the engine may be varied to suit conditions. To increase the speed pull lever **83**, so as to increase the tension on the spring **75**. To reduce the speed lift pawl **79** and allow handle to go forward, thereby releasing the tension of the governor spring.

INSTALLING MARINE ENGINES

ENGINE FOUNDATION timbers should be of sufficient size and well fastened to the boat, timbers to be parallel with the line of propeller shaft and of the proper height. If engine foundation should not be properly in line, undue strain upon engine would be caused when engine base is bolted down, and excessive friction in bearings being the result.

In small engines lag studs are used for fastening base to foundation, but in larger size engines, more especially when hull is of light construction, it is advisable to use several through bolts.

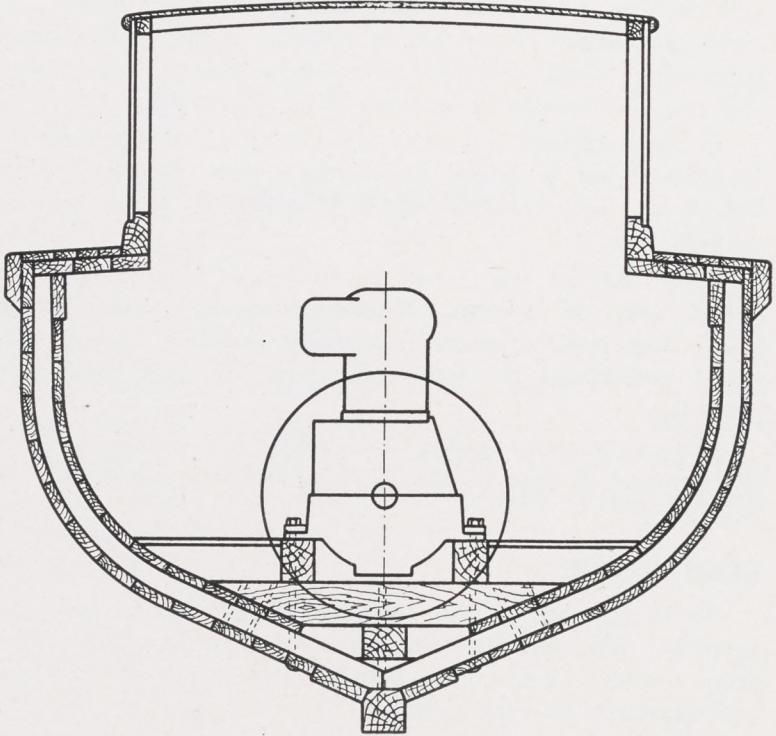
After part of stern post and inside of sleeve log to be square with line of shaft. Engine and propeller shaft should be as near level as possible, allowing clearance beneath fly-wheel, and having the top of the propeller blade sufficiently submerged.

Flanges of stern bearing and stuffing box should be set in red lead and fastened by means of lag studs furnished with the engine.

LEAD SLEEVE

To be put through the deadwood, flared over at ends and expanded tight into the sleeve log by drawing greased wooden plugs through same. Joint between flared ends of lead pipe and bearing to be water-tight.

Clearance between propeller-hub and stern-bearing should be sufficient to allow for lengthening of boat, due to the wood swelling in getting water soaked. Coat tapered end of shafts and threads well with white lead and machine oil, before putting propeller on, as this will prevent the salt water from getting in between and start corrosion. Be sure that the propeller and nut is put on tight.



METHOD OF CONSTRUCTING FOUNDATION IN BOATS

FUEL CONNECTIONS

THE fuel tanks to be placed so that the bottom of tank is at least six inches above the inlet on carburetor. Connect tank and carburetor with clean brass pipe of not less than one-quarter inch. Blow all dirt and cuttings out of each length of pipe before they are screwed together.

In making fuel connections use either shellac or brown soap. By no means use white lead or any sort of paint. See to it that all fuel connections are absolutely tight, as a leak of any sort is dangerous. Put one globe valve as close to the fuel tank as possible, so the fuel may be shut off at tank in order to remove or repair piping.

In most instances it is advisable to place a settler somewhere in fuel pipe line, between globe valve at tank and carburetor, in order to separate water and sediment from the fuel.

WATER PIPING

Place the seacock somewhere near the middle of the boat, and from 18 inches to 24 inches to one side of keel, fasten flange well to planking and put stop cock as near the flange as possible. Use brass pipe and fittings in connecting from the sea to the pump.

Place the strainer outside of the boat to prevent sea weeds, etc., from entering pump.

WET BATTERY

TO MAKE SOLUTION

Fill the jars with clean water up to the brown line on inside, and add gradually the contents of one can of caustic soda to each jar, stirring the solution constantly until it is entirely dissolved. Allow the solution to cool.

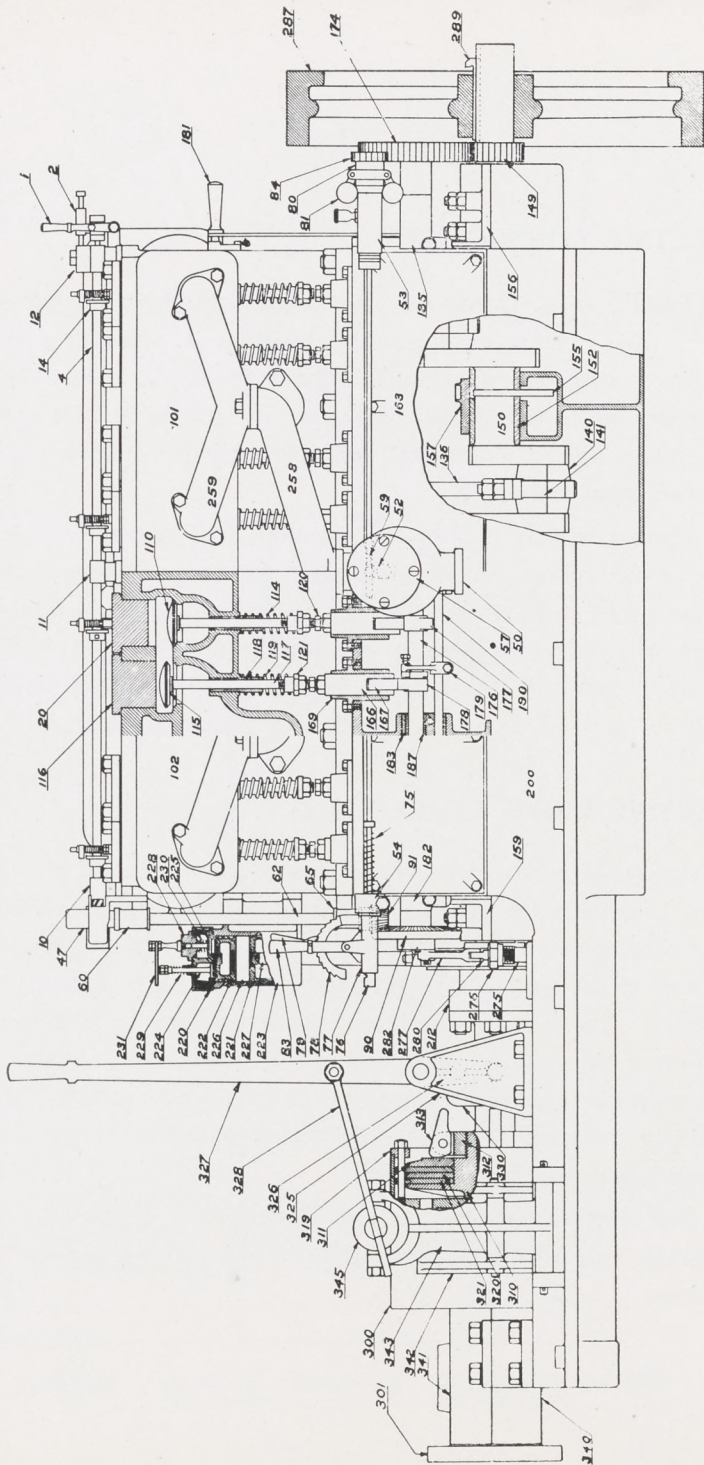
Secure the zincs and carbon plates well to cover by means of screws, see that all joints are firm and that the oxide plates do not touch the zinc plates. Place the cover on the jars so that the oxide and zinc plates are submerged, then raise one side of the cover slightly, just enough to allow oil from bottle furnished, to be poured in. When pouring in oil be sure that plates are submerged in the solution. Do not get oil on the plates.

CAUTION:—The solution will burn the skin and clothes. In stirring the solution avoid splashing it.

TO CONNECT BATTERY

After the cells are set up arrange them in some convenient place. Loosen the thumb-nut on the zinc connection B (see diagram) of the end cell and slip under it one end of the connecting wires. Screw down tightly the thumb-nut on the wire, and attach the other end of the wire to one of the copper connections A on the next cell. The connection having both jamb-nut and thumb-nut is the right one.

Connect the second cell to the third, and the third to fourth, etc., shown in diagram **1**. When finished the copper connection of cell No. **1** and zinc connection of cell No. **6** are free, and the wires of the external circuit should be attached to these.



ATLAS MARINE ENGINE

ELECTRIC CONNECTIONS

WIRES from magneto to be connected to engine, spark coil and switch, as shown by diagram **1**. Weather-proof insulated wire (as furnished) should be used. When it is necessary to fasten wires, only one wire should be put under the same staple; before wires are connected the ends should be scraped clean and bright.

Connect wire from copper connection A of battery to switch, wire from connection B to connect ground post on engine. Connect one wire from magneto to second point on switch, other wire from magneto to connect ground wire on engine. Connect spark coil as shown in diagram. All insulated binding posts on sparkers to be connected with wire from spark coil.

POSITIVE DRIVE, GEARED MAGNETO

On our larger engines whenever so desired, we will attach a geared magneto for generating current for the ignitors. These geared magnetos must be timed so that they will produce the current at the proper time when the contact is broken on the ignitors. These magnetos, if put on at the factory, will be set in proper time to suit the engine. In case the magneto is removed for inspection or repairs, it should be carefully timed again in the same relation to the valve timing as it was when shipped from the factory.

For further particulars and instructions regarding this magneto, see magneto instructions which will accompany the engine.

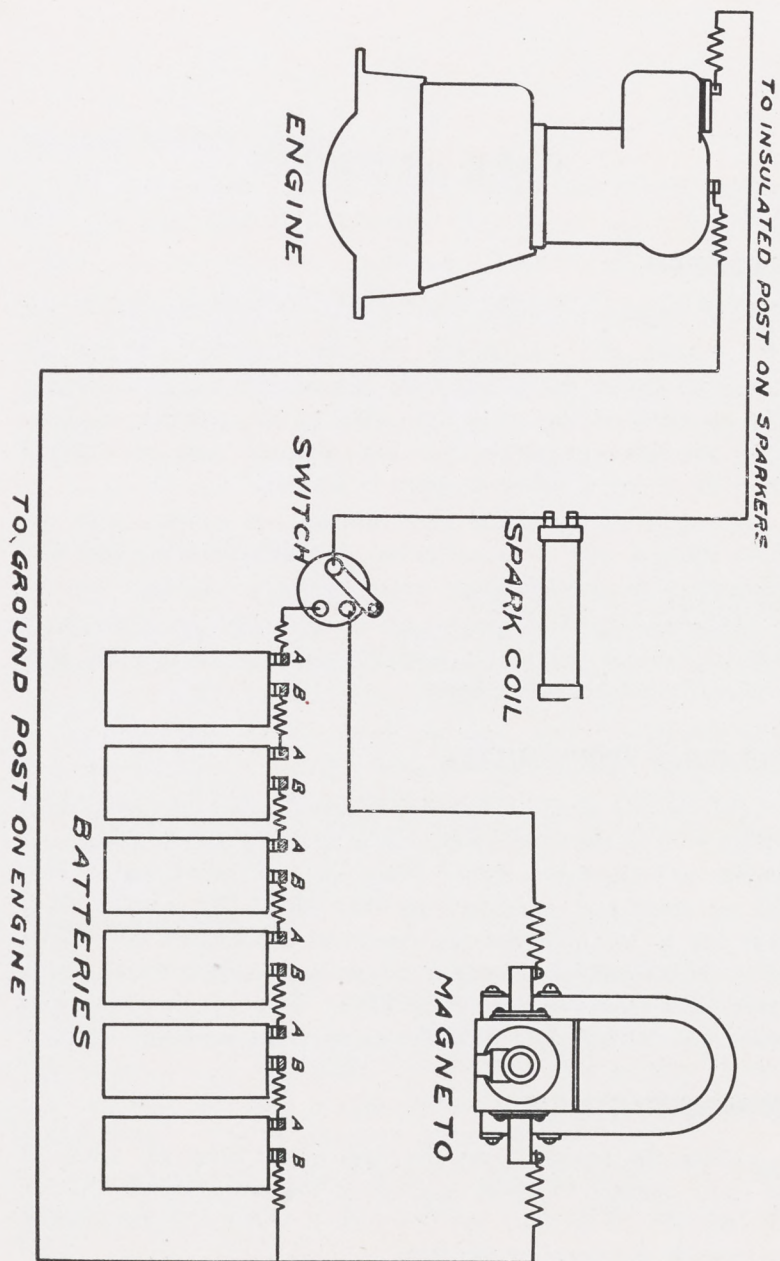


DIAGRAM 1 SHOWING METHOD OF CONNECTING BATTERY AND FRICTION DRIVEN MAGNETO

CARE OF ENGINE

MAGNETO

THE magneto should be run at 1500 to 2500 revolutions per minute, and can be run in either direction. It may be driven by flat or round belt from any suitable source of power. The strength of the spark furnished by the magneto depends upon the speed at which it is run, and this may be changed from the above if different spark is desired.

The magneto should be oiled once in two months, with any good mineral oil. It requires no further attention, except a renewal of its brushes about every twelve or eighteen months.

To renew brushes, remove the brush holder from the magneto and clean the parts carefully with gasoline, insert new brushes in holders and replace.

AIR PUMP FOR WHISTLE

Oil the air pump cylinder at intervals by squirting a little cylinder oil in the inlet elbow. In connecting the air piping use shellac to make joints tight. Place the pop safety valve near the air pump and regulate it to blow off at **75** pounds. It is not safe to use a higher pressure than **80** pounds per square inch. When sufficient pressure is pumped in the air tank, bring lever **231** over the inlet valve **224**. This will hold the inlet valve open and thereby stop the pump from working.

SPARKING DEVICE

When the engine leaves the shop, spark cams are set so as to cause sparker to ignite mixture at the proper time. Should the position of the cam get changed, it will cause the mixture to explode too early or too late.

TO SET SPARK CAMS

RETARD spark shaft by moving handle No. **1** back against the stop, then turn flywheel until piston (of cylinder of which it is desired to set spark cam) is at the extreme top of compression stroke, when both valves are closed. Then loosen spark cam and shift to position so that hammer **24** has just left cam **14**. It is often necessary to ignite the mixture in the forward cylinders slightly later than in the after cylinder, especially if the engine is setting at an angle, in which case the mixture is apt to be stronger in the after cylinder than it is in the forward one.

TO REMOVE SPARKERS

Take off nuts holding down sparkers, turn hammer **24** quarter turn, so as to clear spark shaft, and lift out sparker. Copper gaskets with asbestos insertion are used for sparkers, valve covers and cylinder center plugs.

In case stationary electrode becomes worn, loosen nut and lock nut on top of sparker, turn to new position and tighten nuts again. If oscillating blade becomes worn, bend blade so that there is 1/16-inch clearance between blade and stationary electrode.

REMOVING PISTON

Take off center frame cover **164**, take out cotter pin, unscrew nuts and remove bolts **142**, take off crank pin boxes **140** and **141** and allow piston **125** to be lowered down and rest on crank shaft web **150**. Turn crank shaft slightly toward you and you are able to take piston out through opening in center frame. Top of piston to come out first.

In large engines it is convenient to remove center plug **105**, allowing a stud to be screwed into top of piston to assist in lowering piston on to web.

REMOVING VALVES

TO take out valve, take off valve plug **116** or **120**, depending upon which valve is to be inspected, unscrew lock nut and valve spring nut **121**, and then push valve through port in cylinder.

REVERSE GEAR

DRUM

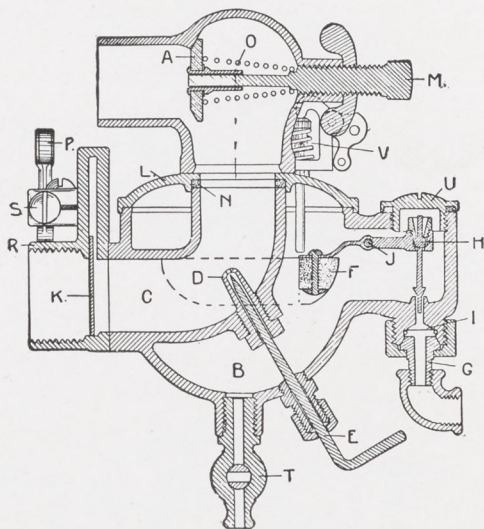
The gears in the drum, when reversing, should be constantly running in compound. Fill the drum with a good grade of compound, when needed, through the plugged hole in after end of drum. The gears need no further care until they should require some more compound.

FRICION CLUTCH is of the multiple-disc type. In case the clutch begins to slip, loosen one of the bolts holding spreader collar **312** together, and turn collar slightly toward the port side, thereby tightening on the threads of driver **310**. Be sure to tighten bolts again before attempting to run the engine. Plates **320** and **321** should be oiled at times by pouring oil in the open end of the reverse gear drum.

BRAKE SHOES

If the brake shoes become too loose, so as not to hold drum stationary when reversing, tighten top rod connecting brake post binder **345**. Be sure that brake shoes are entirely free of drum when engine is going ahead.

INSTRUCTIONS FOR CONNECTING AND ADJUSTING MODEL "D":



Connect carburetor to intake pipe so that it sits about six inches below bottom of gasoline tank, so that the bowl may be filled by gravity. Connect a pipe or tube from gasoline tank to gasoline union. Pipe to be brass or copper and not less than $\frac{1}{8}$ -inch hole. (N. B.—Do not use rubber tube as float chamber will not fill properly, and rubber makes a sediment in gasoline.) Be sure before connecting that there are no scrapings, filings, or other particles of dirt in the gasoline tank, and that the tube or pipe is thoroughly free from dirt or corrosion.

After all connections are properly made, see that air valve seats lightly, but firmly. This is regulated by adjusting screw "M." Turning adjusting screw to the right increases, and turning to the left decreases the tension of the air valve spring. The needle valve "E" should be closed and then opened about three-quarters of a turn.

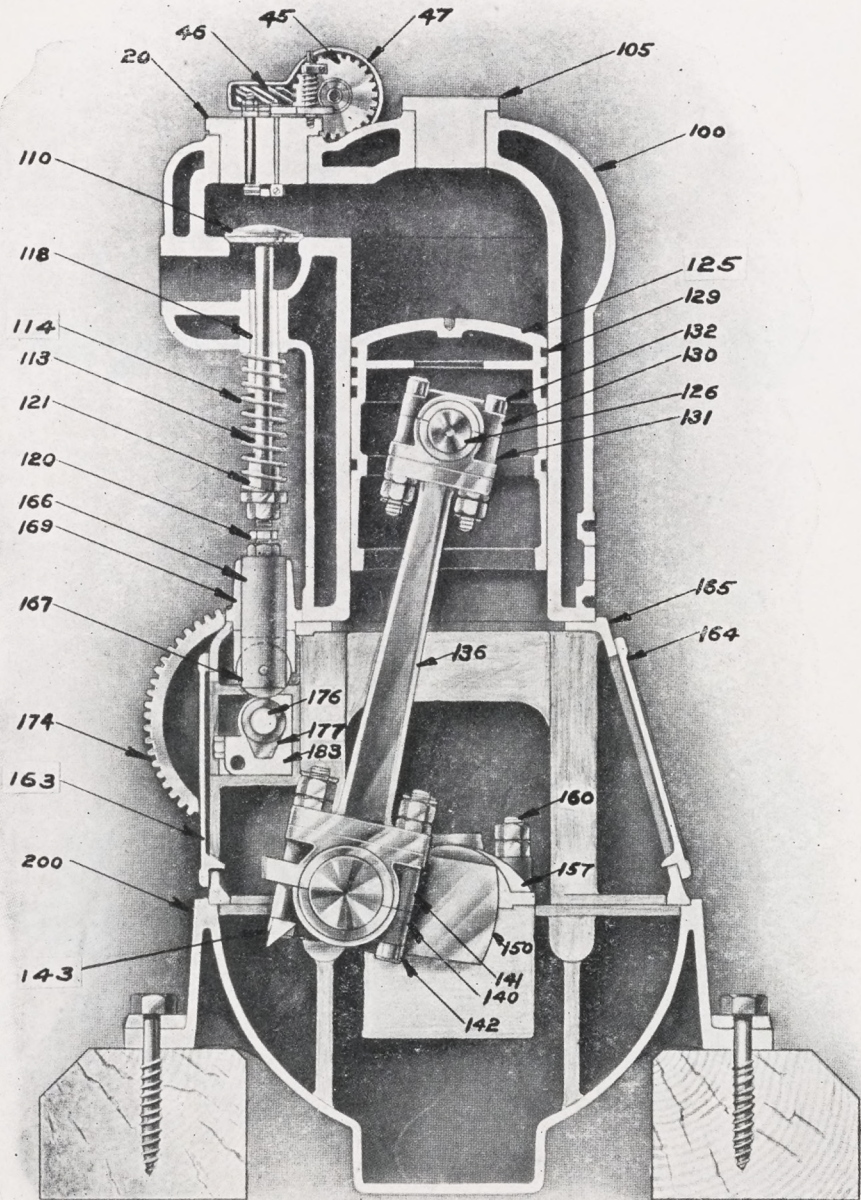
The carburetor is now to be adjusted for low speed. Retard spark and open throttle about one-fourth, turn on gasoline and increase the supply until the engine runs smoothly without missing. The throttle should be set by screw "S" to prevent closing completely.

In making adjustment for high speed, open throttle wide and advance spark about one-quarter, and if the engine does not run smoothly, but backfires, it indicates that the tension of the air valve spring is too weak. If, after two complete turns of adjusting screw "M" to the right, the irregularity is not eliminated, give the needle valve "E" about one-tenth of a turn to the left, which gives the mixture just a trifle more gasoline.

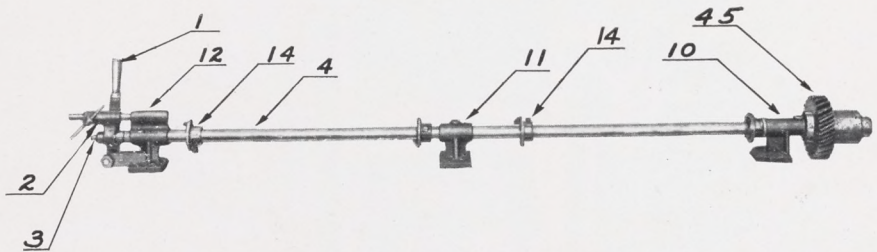
After these adjustments are made, tighten the lock nut on adjusting screw "M," also the packing nut on needle valve, and the carburetor should require no further attention.

OIL

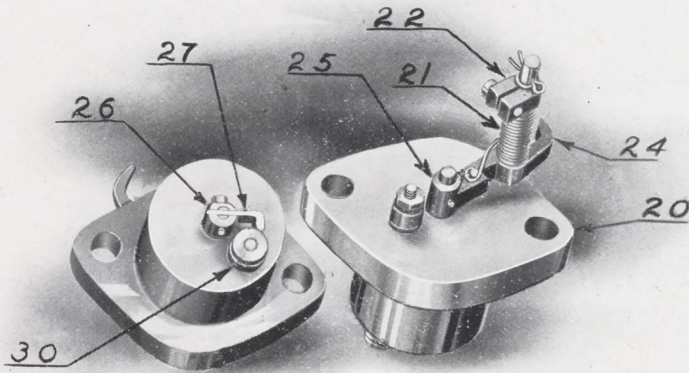
THE oil level in the crank pit should be at the height that the splashers **143** dip into the oil about one-quarter inch, and a fresh supply of oil should be fed into the base, to help maintain this level at its proper height. The splashers striking the oil throws it over all the working parts inside of the engine, including the piston and cylinder, which receive the oil in this manner. In marine engines, due to the usual angle of the engine, the oil has a tendency to work aft and to replenish the oil in the forward base, and maintaining the oil level equal in all crank pits. The base casting is provided with angular oil troughs so arranged that the surplus amount of oil will lodge in these oil troughs and run through hole in the division wall (drilled for that purpose) into next crank pit.



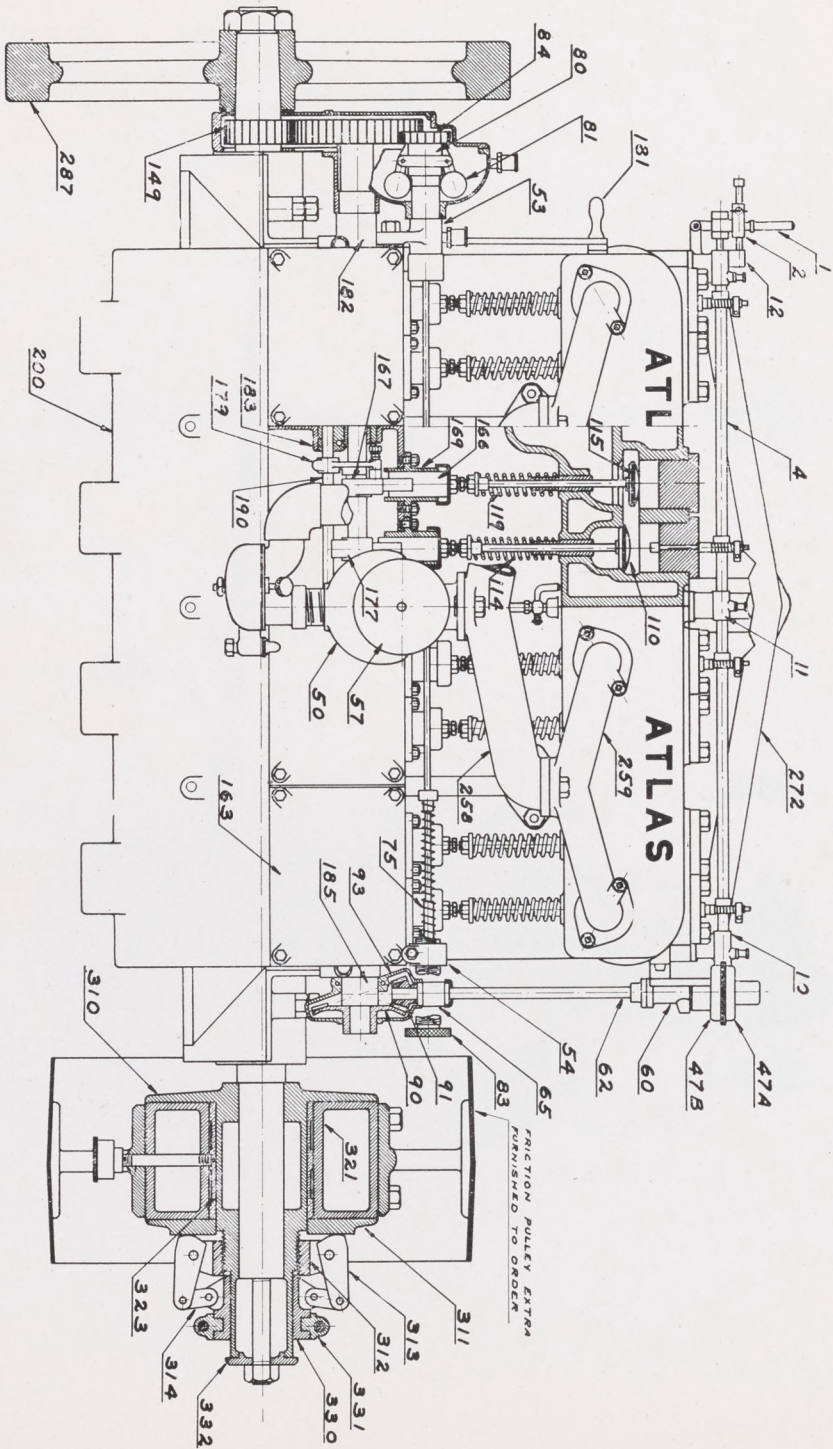
SECTIONAL VIEW



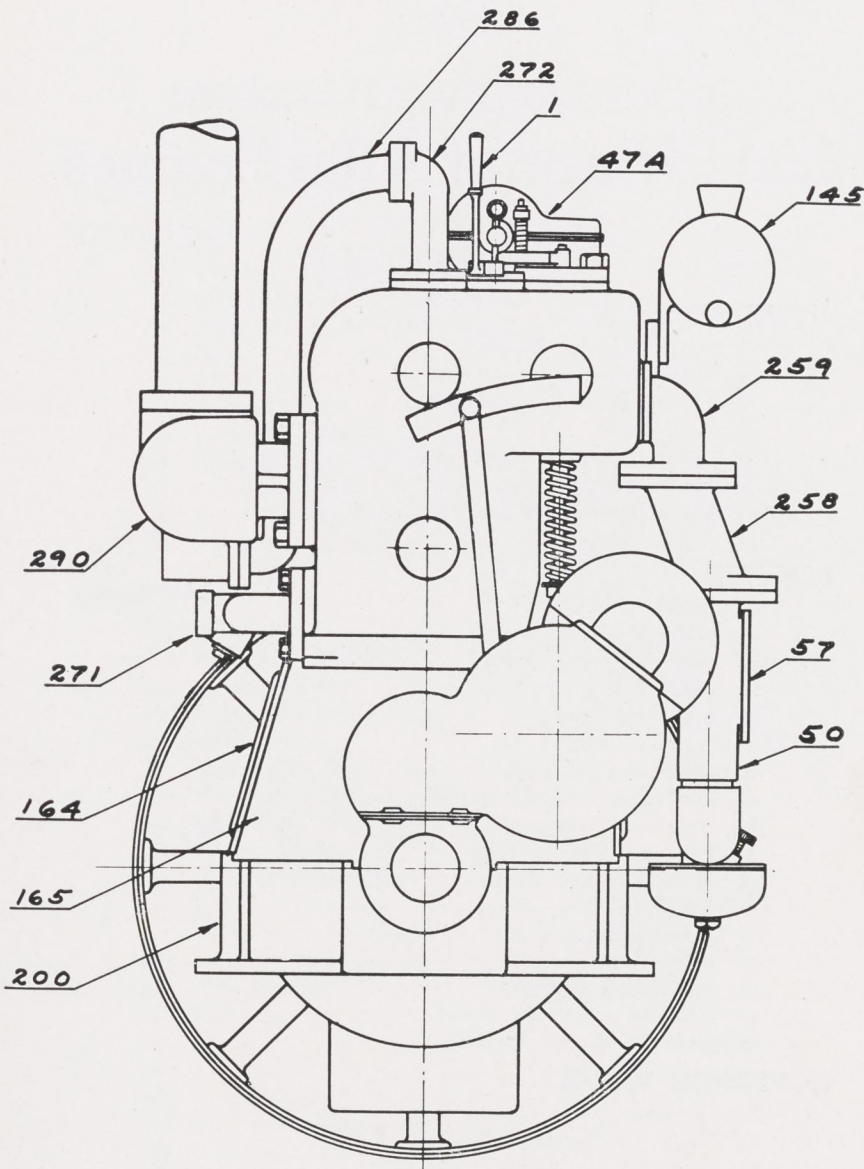
SPARKER SHAFT



ATLAS SPARKER



SPECIAL DUST PROOF PORTABLE ENGINE



SPECIAL DUST PROOF PORTABLE ENGINE

In Ordering Repair Parts Give the Engine Number

List of Parts of Atlas Engines

REFERENCE LIST

SPARK ADVANCE

- 1 Spark Advance Handle
- 2 Spark Advance Shifter
- 3 Central Spark Advance Rod.
- 4 Spark Shaft
- 10 Spark Shaft Bearings—after end
- 11 Spark Shaft Bearing—center
- 12 Spark Shaft Bearing—flywheel end
- 14 Spark Cam

SPARKER

- 20 Sparker Body
- 21 Sparker Spring
- 22 Sparker Spring Clamp
- 23 Sparker Hammer Stud
- 24 Sparker Hammer
- 25 Sparker Anvil
- 26 Oscillating Electrode
- 27 Oscillating Electrode Blade
- 30 Stationary Electrode
- 31 Nuts for Binding Posts
- 32 Mica Insulating Washer
- 33 Mica Insulating Tubes
- 45 Spiral Gear—cast iron
- 46 Spiral Gear—bronze
- 47 Spiral Gear Shield
- 48 Hub for Cast Iron Spiral
- 49 Hub for Bronze Spiral

GOVERNOR VALVE

- 50 Governor Valve Casting
- 51 Valve for Governor
- 52 Lever for Governor Valve
- 53 Bearing for Governor
- 54 Bearing for Speed Control
- 57 Governor Valve Cover

- 59 Governor Lever Connecting Rod
- 60 Top Vertical Shaft Bearing
- 61 Bracket for Top Vertical Shaft Bearing
- 65 Lower Vertical Shaft Bearing

GOVERNOR

- 75 Governor Compression Spring
- 76 Steel Rack for Tension Spring
- 77 Socket for Speed Control Rack
- 78 Speed Pawl Sector
- 79 Speed Handle Pawl
- 80 Governor Yoke
- 81 Governor Weights
- 83 Governor Speed Handle
- 84 Governor Pinion
- 90 Bevel Gear on Cam Shaft
- 91 Vertical Shaft Pinion

CYLINDER

- 100 Cylinder
- 101 Cylinder Forward
- 102 Cylinder After
- 105 Cylinder Center Plug
- 110 Inlet Valve
- 111 Inlet Valve Plug (water jacketed)
- 113 Inlet Valve Stem
- 114 Inlet Valve Spring
- 115 Exhaust Valve
- 116 Exhaust Valve Plug
- 117 Exhaust Valve Stem
- 118 Valve Stem Bushing
- 119 Exhaust Valve Spring
- 120 Adjusting Screw on Valve Lifter
- 121 Valve Spring Nut
- 125 Piston
- 126 Piston Pin
- 129 Piston Ring
- 130 Piston Pin Boxes Cap
- 131 Piston Pin Boxes Foot
- 132 Piston Pin Boxes Bolts
- 136 Connecting Rod

CRANK SHAFT

- 140 Crank Pin Boxes Cap
- 141 Crank Pin Boxes Foot
- 142 Crank Pin Boxes Bolts
- 143 Oil Splashers
- 149 Crank Shaft Pinion
- 150 Crank Shaft
- 151 Crank Shaft Bushing—Flywheel End Bearing
- 152 Crank Shaft Bushing—Center Bearing
- 154 Crank Shaft Bushing—After End Bearing
- 155 Crank Shaft Oil Ring
- 156 Crank Shaft Cap—Flywheel End Bearing
- 157 Crank Shaft Cap—Center Bearing
- 159 Crank Shaft Cap—After End Bearing
- 160 Crank Shaft Cap Studs

CENTER FRAME

- 163 Center Frame Cover—Valve Side
- 164 Center Frame Cover—Exhaust Side
- 165 Center Frame
- 166 Valve Lifter
- 167 Valve Lifter Roller
- 169 Valve Lifter Guide
- 174 Cam Shaft Gear
- 176 Cam Shaft
- 177 Inlet Cam
- 178 Exhaust Cam
- 179 Relief Crank
- 181 Relief Handle
- 182 Cam Shaft Bearing—After End Bearing
- 183 Cam Shaft Bearing—Center Bearing
- 185 Cam Shaft Bearing—Flywheel End Bearing
- 186 Cam Shaft Bushing—After End Bearing
- 187 Cam Shaft Bushing—Center Bearing
- 189 Cam Shaft Bushing—Flywheel End Bearing
- 190 Relief Shaft
- 195 Intermediate Gear
- 196 Intermediate Gear Bearing
- 198 Relief Latch

- 200 Base
- 211 Stub Shaft
- 212 Stub Shaft Coupling

AIR PUMP

- 220 Air Pump Head
- 221 Air Pump Piston
- 222 Air Pump Piston Rings
- 223 Air Pump Body
- 224 Air Pump Inlet Valve
- 225 Air Pump Outlet Valve
- 226 Air Pump Piston Pin
- 227 Air Pump Connecting Rod
- 228 Air Pump Valve Nut
- 229 Air Pump Inlet Valve Spring
- 230 Air Pump Outlet Valve Spring
- 231 Air Pump Relief Handle
- 236 Air Pump Eccentric Strap Foot
- 237 Air Pump Eccentric Strap Cap
- 258 Inlet Connecting Pipe
- 259 Inlet Pipe

OIL PUMPS

- 275 Oil Pump Body
- 276 Oil Pump Stuffing Box
- 277 Oil Pump Connecting Rod
- 280 Oil Pump Plunger
- 287 Flywheel
- 289 Flywheel Key
- 290 Exhaust Casting
- 294 Magneto Bracket
- 296 Magneto

REVERSE GEAR

- 300 Reverse Gear Drum
- 301 Thrust Quill, Gear and Coupling
- 302 Center Gear
- 304 Drum Cover

- 306 Reversing Pinion, Long Face
- 307 Reversing Pinion, Short Face
- 308 Reversing Pinion Pin
- 310 Driver for Friction with Hub
- 311 Driver for Friction with Square Hole
- 312 Spreader Collar
- 313 Dogs for Friction
- 315 Spring for Friction Dog
- 319 Retainer Ring
- 320 Friction Plate Square Hole
- 321 Friction Plate Round Hole
- 322 After Thrust Quill Bushing
- 323 Forward Thrust Quill Bushing
- 324 Reversing Pinion Bushing
- 325 Cone Shifter Bearing
- 326 Cone Shifter
- 327 Reverse Lever
- 328 Wedge for Brake Shoes
- 330 Cone for Clutch
- 331 Cone Collar
- 340 Thrust Bearing Box
- 341 Thrust Bearing Cap
- 342 Brake Shoe
- 343 Brake Shoe Post
- 345 Brake Shoe Binder

